ACE PLUS CORP.

EX-G009

HDMI 1.3 over CAT5 Extender with IR Control Path

User Manual

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Safety and Notice

The **EX-G009 HDMI 1.3 over CAT5 Extender with IR Control Path** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipments, the EX-G009 should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

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Introduction

The **EX-G009 HDMI 1.3 over CAT5 Extender with IR Control Path** boosts up your HDMI transmission distance up to 60m (200ft) in HDTV 720p / 1080i format. With two low cost CAT-5/5e/6 LAN cables, users can readily extend HDTV sources from DVD players, Blu-ray Disc player, PS3, PC, and any other kinds of sources compliant with TMDS to distant display monitors including HDMI enabled TV sets, LCD PC monitors, or projectors. This cost effective flexibility makes HDCP compliant DVD players or PS3 transmit high quality video and audio with a greater distance at the minimal cost, when integrating several components apart. In addition, with the embedded infrared (IR) receiving and emitting units to facilitate the control path, users can enjoy high quality audio/video and control the HDMI sources from the remote site instantly.

The EX-G009 includes two units: EX-G009-TX as the transmitting unit and EX-G009-RX as the receiving unit. The transmitting unit is used to transfer the HDMI/DVI and IR signals input and carry the signals through two RJ-45 connectors over two low cost CAT-5/5e/6 LAN cables. The receiving unit is responsible for equalizing transferred TMDS multimedia data and re-sending IR signals. The transmission distance between the sending and receiving units can be up to 60m (200ft) under HD resolution (720p or 1080i) or 40m (130ft) under Full HD resolution (1080p). With 8-level equalization control on the receiving unit, users can adjust the equalization scale to the received TMDS signals, and therefore optimize the transmission distance between source and destination.

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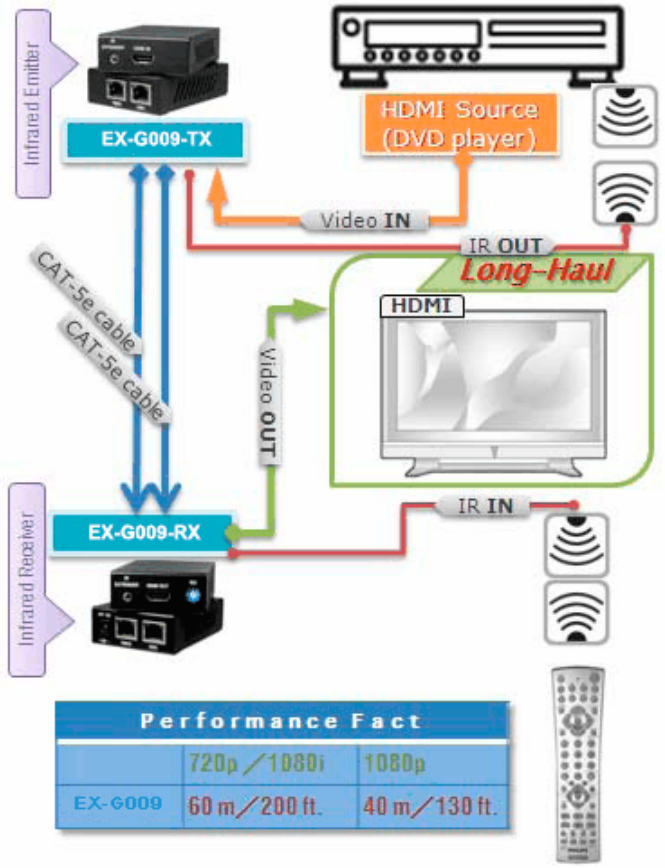
Features

- HDMI 1.3c compliant
- Extends the transmission distance up to 60m (200ft) from the sources under 1080i or 720p
- Extends the transmission distance up to 40m (130ft) from the sources under 1080p
- Provides independent DDC channel, fully HDCP compliant
- Minimizes the cable skew by adjustable 8-level equalization control
- Embedded IR control path
- Pure unaltered uncompressed 7.1ch digital HDMI over LAN cable transmission
- Allows cascading
- Perfectly integrated with other HDMI over CAT5 series products

The length depends on the characteristics and quality of the cables. Higher resolutions and longer transmission distances require low skew cables (<25ns/100m) for best performance. Unshielded CAT6 with metal RJ-45 connectors is recommended.



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Model Name		EX-G006		EX-G009		EX-G007	
Technical		EX-G006-TX	EX-G006-RX	EX-G009-TX	EX-G009-RX	EX-G007-TX	EX-G007-RX aka EX-G076A
Role of usage		Transmitter [TX]	Receiver [RX]	Transmitter [TX]	Receiver [RX]	Transmitter [TX]	Receiver [RX]
HDMI compliance		HDMI 1.3c				HDMI 1.2a	
HDCP compliance		Yes					
Video bandwidth		Single-link 340MHz [10.2Gbps]				Single-link 165MHz [4.95Gbps]	
Video support		480i / 480p / 720p / 1080i / 1080p60					
Transmission		Full HD (1080p)-40m (130ft) [CAT5e] / 50m (165ft) [CAT6] HD (720p/1080i)-50m (165ft) [CAT5e] / 60m (200ft) [CAT6]					
Audio support		Surround sound (up to 7.1ch) or stereo digital audio					
Equalization		8-level digital control at RX					
Input TMDS signal		1.2 Volts [peak-to-peak]					
Input DDC signal		5 Volts [peak-to-peak, TTL]					
ESD protection		[1] Human body model — ±15kV [air-gap discharge] & ±8kV [contact discharge] [2] Core chipset — ±8kV					
PCB stack-up		4-layer board [impedance control — differential 100Ω; single 50Ω]					
Input		1x HDMI	2x RJ-45	1x HDMI	2x RJ-45 1x 3.5mm	1x HDMI	1x RJ-45
Output		2x RJ-45	1x HDMI	2x RJ-45 1x 3.5mm	1x HDMI	1x RJ-45	1x HDMI
HDMI source control		No		Controllable through IR control path from IR receiver at receiver sites		No	
IR remote control		N/A		Electro-optical characteristics: τ = 25° Carrier frequency: 38kHz		N/A	
HDMI connector		Type A [19-pin female]					
RJ-45 connector		WE/SS 8P8C with 2 LED indicators					
3.5mm connector		None	None	IR emitter	IR receiver	None	None
Rotary switch		None	EQ	None	EQ	Mode	EQ
Mechanical		EX-G006		EX-G009		EX-G007	
Housing		Metal case					
Dimensions [L x W x H]	Model	[TX/RX] – 85 x 60 x 25mm [3.3”x2.4”x1”]					
	Package	270 x 175 x 80mm [10.6”x6.9”x3.1”]					
	Carton	450 x 370 x 300mm (1’5.7”x1’2.6”x11.8”]					
Weight	Model	315g [11.1oz]		320g [11.3oz]		315g [11.1oz]	
	Package	685g [1.5 lbs]		720g [1.6 lbs]		715g [1.6 lbs]	
Fixedness		Wall-mounting case upon request					
Power supply		5V 4A DC		5V 4A DC		5V 2A DC	
Power consumption		1 Watt [max]					
Operation temperature		0~40°C [32~104°F]					
Storage temperature		-20~60°C [-4~140°F]					
Relative humidity		20~90% RH [no condensation]					
Package Contents		1x EX-G006 [TX & RX] 1x 5V power adapter 1x User Manual		1x EX-G009 [TX & RX] 1x IR emitter cable 1x IR receiver cable 1x 5V power adapter 1x User Manual		1x EX-G007 [TX & RX] 2x 5V power adapter 1x User Manual	

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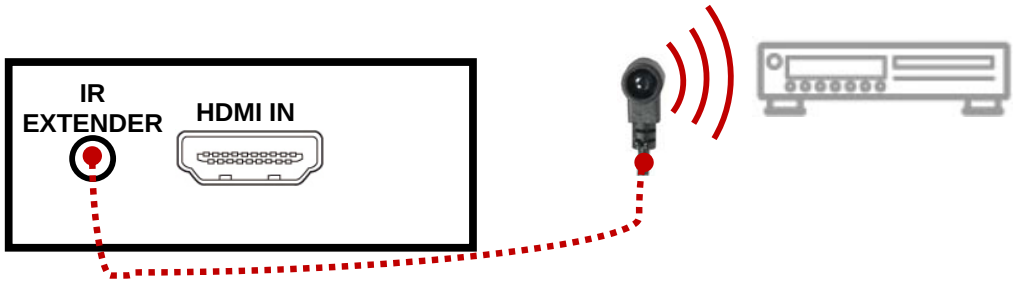
Panel Descriptions

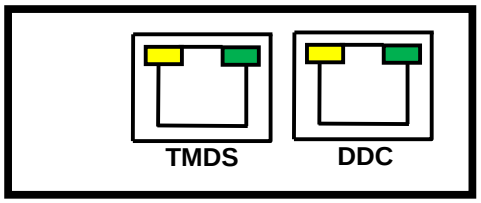
Front Panel — Transmitting Unit EX-G009-TX



HDMI IN: Connect to a HDMI source with a HDMI M-M cable here

IR EXTENDER: Extendable infrared sending socket for plugging in the extension cable of IR emitter

Rear Panel — Transmitting Unit EX-G009-TX



TMDS: Plug in a CAT-5/5e/6 cable that needs to be linked to the TMDS connector of the receiving unit EX-G009-RX.

DDC: Plug in a CAT-5/5e/6 cable that needs to be linked to the DDC connector of the receiving unit EX-G009-RX.

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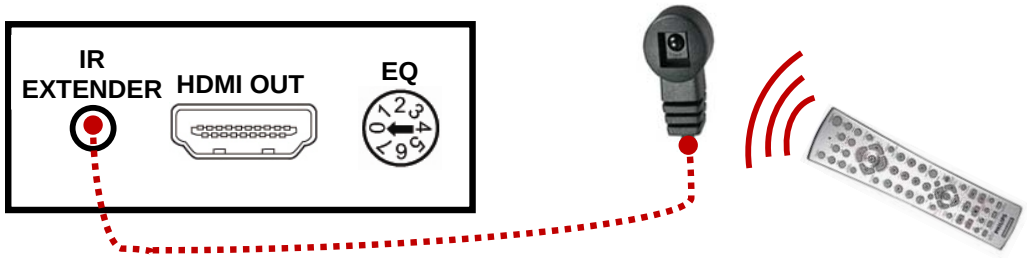
Front View — Receiving Unit EX-G009-RX

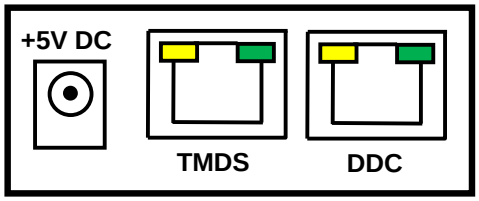


HDMI OUT: Connect to a HDMI display with a HDMI M-M cable here.

EQ: Adjust the 8-level equalization control knob to the received HDMI signals. 0 – 7 = strongest – weakest. It is recommended to switch from 7 to 0 to find the optimal visual experience.

IR EXTENDER: Extendable infrared reception socket for plugging in the extension cable of IR receiver.

Rear Panel — Receiving Unit EX-G009-RX



TMDS: Plug in a CAT-5/5e/6 cable that needs to be linked to the TMDS connector of the transmitting unit EX-G009-TX.

DDC: Plug in a CAT-5/5e/6 cable that needs to be linked to the DDC connector of the transmitting unit EX-G009-TX.

+5V DC: Connect to 5V DC power supply.

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IR Control Path

IR Cables

IR Emitter Cable

IR Receiver Cable

IR Sockets

EX-G009-TX

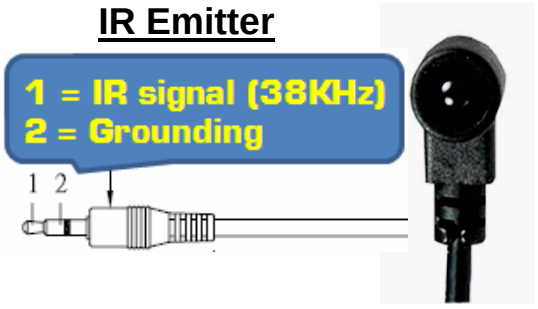
IR Extender: Plug in the IR emitter cable here to transmit all IR command signals received from the IR receiver.

EX-G009-RX

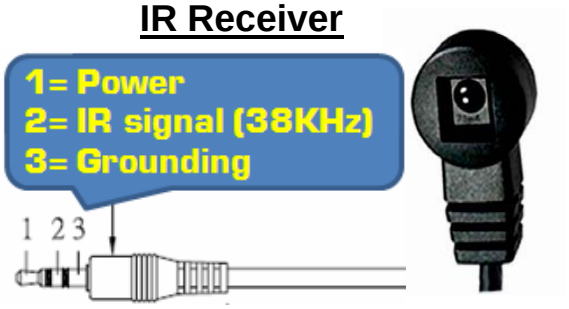
IR Extender: Plug in IR receiver cable connected here to receive all IR command signals from the IR remote control of the HDMI source machine.

Definition of IR Earphone Jack

IR Emitter



IR Receiver



You can buy any IR extension cables in the market that are compatible to the definition of the IR sockets for the matrix if necessary for replacement use. However, IR cables longer than 2m (6-ft) may not work.

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Supported IR Data Format

Data Format	Suitable	Not Recommended
NEC	☑	
RC5	☑	
TOSHIBA MICOM CODE	☑	
GRUNDIG CODE	☑	
SONY 12 BIT CODE	☑	
SONY 15 BIT CODE	☑	
SONY 20 BIT CODE	☑	
RCA CODE		☑
RCM CODE		☑
MATSUSHITA CODE		☑
MITSUBISHI CODE	☑	
ZENITH CODE	☑	
JVC CODE	☑	
M50560-001P	☑	
MN6125H	☑	
MN6125L	☑	
MN6014_C5D7	☑	
MN6014-C6D6	☑	
MC14457P	☑	
LC7464(AHEA)	☑	
GEMINI_CM	☑	

Hardware Installation

1. Connect your HDMI / DVI source (such as a DVD player) to the transmitting unit EX-G009-TX.
2. Connect the IR transmitting cable to the transmitting unit EX-G009-TX, and make the IR emitter directly point to the IR of HDMI source.

3. Connect your HDMI / DVI display (such as a LCD TV or plasma TV) to the receiving unit EX-G009-RX.

4. Connect the IR receiving cable to the receiving unit EX-G009-RX, and make the IR receiver directly point to the user.
5. Connect your LAN cables between the transmitting and receiving units.
6. Make sure your LAN cables are tightly connected and not loose.
7. Plug in 5V DC power cord to the power jack of the receiving unit EX-G009-RX.
8. **If a flickering or a blinking image is shown on the display, please try to adjust the rotational EQ control to improve the cable skew. 0 stands for the strongest EQ while 7 stands for the weakest. Try adjusting the EQ from 7 to 0.**

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Notice

1. If the DVI or HDMI device requires the EDID information, please use EDID Reader/Writer to retrieve and provide DVI/HDMI EDID information.
2. All HDMI over CAT5 transmission distances are measured using Belden 1583A CAT5e 125MHz LAN cable and ASTRODESIGN Video Signal Generator VG-859C.
3. The transmission length is largely affected by the type of LAN cables, the type of HDMI sources, and the type of HDMI display. The testing result shows solid LAN cables (usually in bulk cable 300m/1000ft form) can transmit a lot longer signals than stranded LAN cables (usually in patch cord form). Shielded STP cables are better suit than unshielded UTP cables. A solid UTP CAT5e cable shows longer transmission length than stranded STP CAT6 cable. For long extension users, solid LAN cables are your only choice.
4. EIA/TIA-568-B termination (T568B) for LAN cables is recommended for better performance.
5. To reduce the interference among the unshielded twisted pairs of wires in LAN cable, you can use shielded LAN cables to improve EMI problems, which is worsen in long transmission.
6. Because the quality of the LAN cables has the major effects in how long transmission distance will be made and how good is the received display, the actual transmission length is subject to your LAN cables. For resolution greater than 1080i or 1280x1024, a CAT6 cable is recommended.
7. If your HDMI display has multiple HDMI inputs, it is found that the first HDMI input [HDMI input #1] generally can produce better transmission performance among all HDMI inputs.

Performance Guide for HDMI over LAN Cable Transmission

Performance rating		**Type of LAN cable**		
Wiring	**Shielding**	**CAT5**	**CAT5e**	**CAT6**
Solid	Unshielded (UTP)	★★★	★★★★	★★★★★
	Shielded (STP)	★★★	★★★	★★★★
Stranded	Unshielded (UTP)	★	★★	★★
	Shielded (STP)	★	★	★★
Termination		Please use **EIA/TIA-568-B** termination (**T568B**) at any time		

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Limited Warranty

The SELLER warrants the **EX-G009 HDMI 1.3 over CAT5 Extender with IR Control Path** to be free from defects in the material and workmanship for 1 year from the date of purchase from the SELLER or an authorized dealer. Should this product fail to be in good working order within 1 year warranty period, The SELLER, at its option, repair or replace the unit, provided that the unit has not been subjected to accident, disaster, abuse or any unauthorized modifications including static discharge and power surges.

Unit that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for 90 days from the day of reshipment to the BUYER. If the unit is delivered by mail, customers agree to insure the unit or assume the risk of loss or damage in transit. Under no circumstances will a unit be accepted without a return authorization number.

The warranty is in lieu of all other warranties expressed or implied, including without limitations, any other implied warranty or fitness or merchantability for any particular purpose, all of which are expressly disclaimed.

Proof of sale may be required in order to claim warranty. Customers outside Taiwan are responsible for shipping charges to and from the SELLER. Cables are limited to a 30 day warranty and cable must be free from any markings, scratches, and neatly coiled.

The content of this manual has been carefully checked and is believed to be accurate. However, The SELLER assumes no responsibility for any inaccuracies that may be contained in this manual. The SELLER will NOT be liable for direct, indirect, incidental, special, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. Also, the technical information contained herein regarding the EX-G009 features and specifications is subject to change without further notice.

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